Series 10-/11-/21-/22-CM2-Z

ø20, ø25, ø32, ø40
Air Cylinder

RoHS

How to Order

Clean series

10	Relief type
11	Vacuum suction type

Built-in magnet

Nil	No
D	With auto switch (Built-in magnet)

10-C D M 2 L 40 □ - 150 A F Z - M9BW □

21-C D M 2 L 40 □ - 150 A □ Z - M9BW □

Mounting

B	Basic (Double-side bossed)
L	Axial foot
F	Rod flange
G	Head flange
BZ	Boss-cut, Basic
FZ	Boss-cut, Rod flange

Auto switch

Solid state	M9B, M9BW
Reed switch	A93

Rod end thread

Nil	Male rod end
F	Female rod end

Bore size (mm)

Copper, fluorine and silicone-free + Low particle generation

21	Relief type
22	Vacuum suction type

Port thread type

Nil	Rc
TN	NPT*
TF	G*

* Rubber bumper only

Cushion

Nil	Rubber bumper
A	Air cushion

Cylinder stroke (mm)

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	n pcs.

Model

	Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Relief type	10-/21-CM2□20	20	1/8	Non-lube	Double acting, Single rod	25, 50, 75, 100, 125, 150, 200, 250, 300	○	○	○
	10-/21-CM2□25	25							
	10-/21-CM2□32	32							
	10-/21-CM2□40	40	1/4						
Vacuum suction type	11-/22-CM2□20	20	1/8						
	11-/22-CM2□25	25							
	11-/22-CM2□32	32							
	11-/22-CM2□40	40	1/4						

Specifications

Item \ Bore size (mm)	20/25/32/40
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.05 MPa
Ambient and fluid temperature	Without auto switch: –10°C to 70°C With auto switch: –10°C to 60°C (No freezing)
Piston speed	10-/11-: 30 to 400 mm/s, 21-/22-: 50 to 400 mm/s
Stroke length tolerance	$^{+1.4}_{0}$
Mounting	Basic/Axial foot/Rod flange/Head flange
Grease	10-/11-: Fluorine grease 21-/22-: Lithium soap based grease
Cleanliness class (ISO class)	10-: Class 4, 21-: Class 5 11-/22-: Class 3

Suction Flow Rate of Vacuum Suction Type (Reference values)

Bore size	Suction flow rate L/min (ANR)
20/25/32/40	2

Auto Switch Specifications (Refer to the WEB catalog for detailed specifications and auto switches not in the following table.)

Type	Electrical entry	Indicator light	Wiring (Output)	Load voltage			Auto switch model	Lead wire length (m)				Applicable load	
				DC		AC	Band mounting	0.5 (Nil)	1 (M)	3 (L)	5 (Z)		
Solid state auto switch	Grommet	Yes	2-wire	24 V	5 V 12 V	—	**M9B**	●	●	●	○	—	Relay, PLC
							M9BW	●	●	●	○		
Reed auto switch	Grommet	Yes	2-wire	24 V	12 V	100 V	**A93**	●	—	●	●		

Note 1) Lead wire length symbols: 0.5 m.....Nil M9BW
1 m..... M M9BWM
3 m..... L M9BWL
5 m..... Z M9BWZ

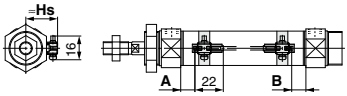
Note 2) Auto switches marked with "○" are produced upon receipt of order.
Note 3) PLC: Programmable Logic Controller

Refer to page 889 for the applicable auto switch list.

Auto Switch Proper Mounting Position (Detection at Stroke End)

Solid state auto switch

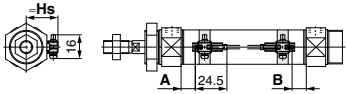
D-M9□
D-M9□W



A and B are the dimensions from the end of the head cover/ rod cover to the end of the auto switch.

Reed auto switch

D-A9□



A and B are the dimensions from the end of the head cover/ rod cover to the end of the auto switch.

Auto Switch Proper Mounting Position (mm)

Auto switch model / Bore size	D-M9□ D-M9□W		D-A9□	
	A	B	A	B
20	11	9.5	7	5.5
25	10	10	6	6
32	11.5	10.5	7.5	6.5
40	17.5	15.5	13.5	11.5

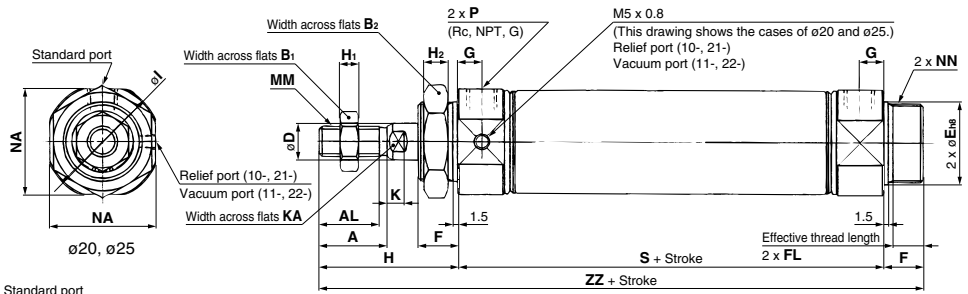
Note) The above-mentioned value is a guide for auto switch mounting positions for stroke end detection. When actually mounting the auto switch, adjust the position after confirming the operating state of the auto switch.

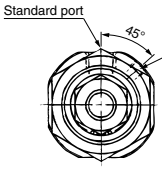
Auto Switch Mounting Height (mm)

Auto switch model / Bore size	D-M9□ D-M9□W D-A9□
	Hs
20	22.5
25	25
32	28.5
40	32.5

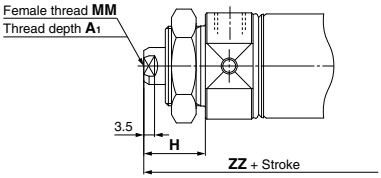
Basic (Double-side Bossed) (B): 10-11-CM2B, 21-22-CM2B

With rubber bumper





Female rod end



Female Rod End (mm)

Bore size	A_1	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

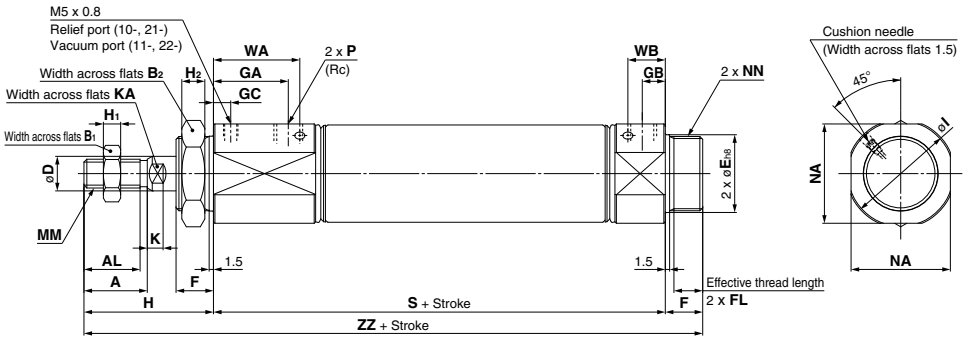
* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

(mm)

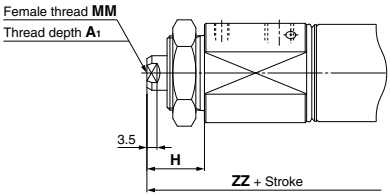
Bore size	A	AL	B_1	B_2	D	E	F	FL	G	H	H_1	H_2	I	K	KA	MM	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	116
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	120
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	122
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	13.5	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	154

Basic (Double-side Bossed) (B): 10-11-CM2B, 21-22-CM2B

With air cushion



Female rod end



Female Rod End (mm)

Bore size	A_1	H	MM	ZZ
20	8	20	M4 x 0.7	113
25	8	20	M5 x 0.8	113
32	12	20	M6 x 1	115
40	13	21	M8 x 1.25	145

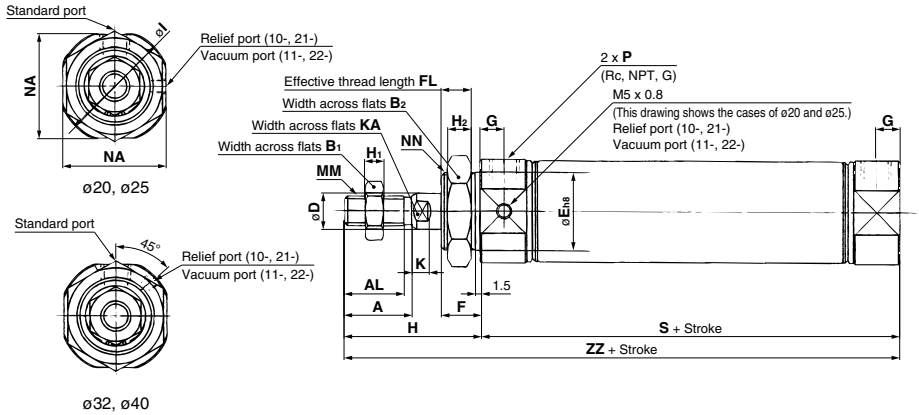
* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

(mm)

Bore size	A	AL	B_1	B_2	D	E	F	FL	GA	GB	GC	H	H_1	H_2	I	K	KA	MM	NA	NN	P	S	WA	WB	ZZ
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	26	8	6	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	80	31	13	134
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	10.5	26	8	6	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	80	31	13	138
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	10.5	26	8	6	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	82	31	13	140
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	13.5	31	11	6	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	108	36	16	174

Boss-cut, Basic (BZ): 10-11-CM2BZ, 21-22-CM2BZ

With rubber bumper

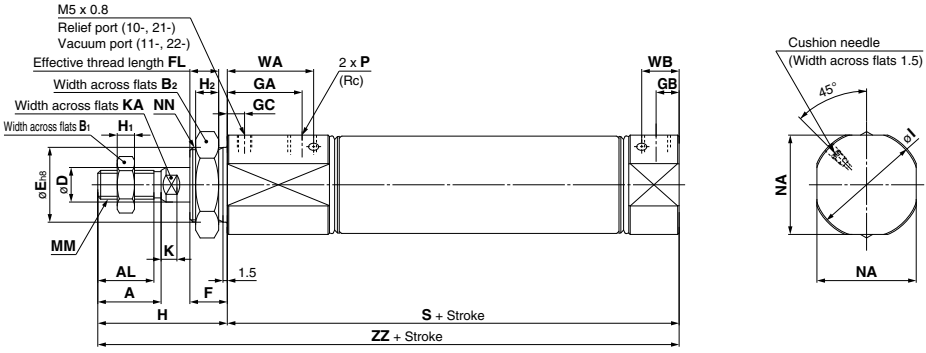


(mm)

Bore size	A	AL	B1	B2	D	E	F	FL	G	H	H1	H2	I	K	KA	MM	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	103
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	107
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	109
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	13.5	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	138

∗ Refer to page 702 for female thread dimensions.

With air cushion



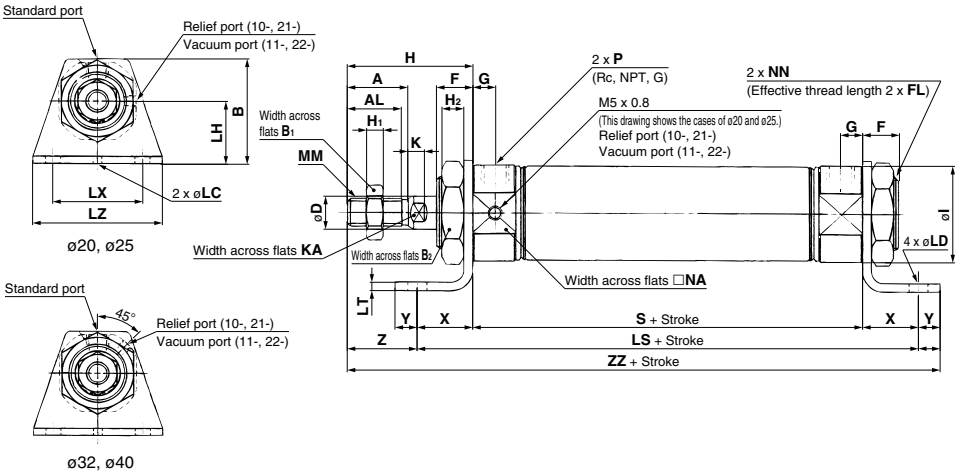
(mm)

Bore size	A	AL	B1	B2	D	E	F	FL	GA	GB	GC	H	H1	H2	I	K	KA	MM	NA	NN	P	S	WA	WB	ZZ
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	26	8	6	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	80	31	13	121
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	10.5	26	8	6	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	80	31	13	125
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	10.5	26	8	6	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	82	31	13	127
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	13.5	31	11	6	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	108	36	16	158

∗ Refer to page 703 for female thread dimensions.

Axial Foot (L): 10-11-CM2L, 21-22-CM2L

With rubber bumper

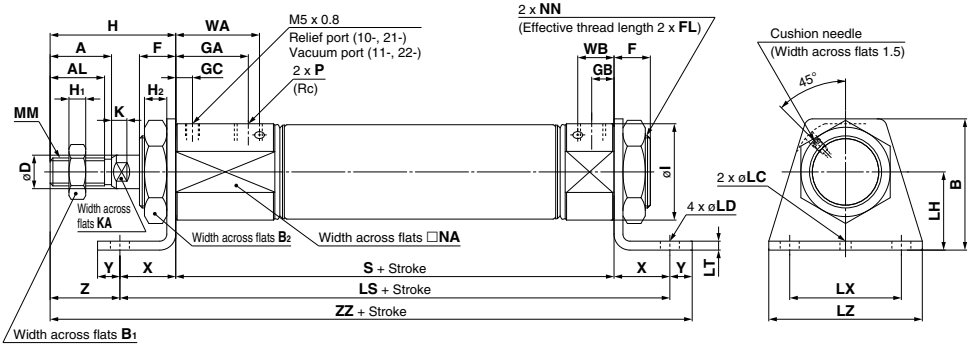


(mm)

Bore size	A	AL	B	B1	B2	D	F	FL	G	H	H1	H2	I	K	KA	LC	LD	LH	LS	LT	LX	LZ	MM	NA	NN	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	10.5	8	41	5	8	28	5	6	4	6.8	25	102	3.2	40	55	M8 x 1.25	24	M20 x 1.5	1/8	62	20	8	21	131
25	22	19.5	47	17	32	10	13	10.5	8	45	6	8	33.5	5.5	8	4	6.8	28	102	3.2	40	55	M10 x 1.25	30	M26 x 1.5	1/8	62	20	8	25	135
32	22	19.5	47	17	32	12	13	10.5	8	45	6	8	37.5	5.5	10	4	6.8	28	104	3.2	40	55	M10 x 1.25	34.5	M26 x 1.5	1/8	64	20	8	25	137
40	24	21	54	22	41	14	16	13.5	11	50	8	10	46.5	7	12	4	7	30	134	3.2	55	75	M14 x 1.5	42.5	M32 x 2	1/4	88	23	10	27	171

∗ The bracket is shipped together. ∗ Refer to page 702 for female thread dimensions.

With air cushion



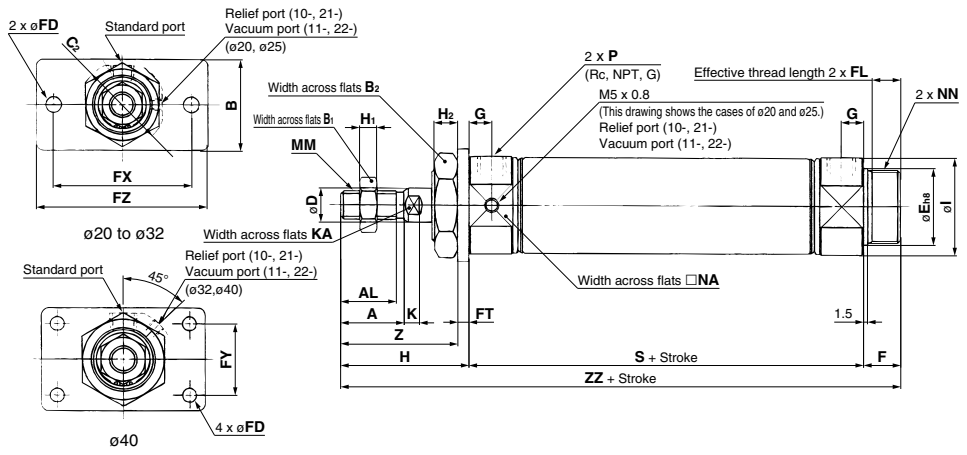
(mm)

Bore size	A	AL	B	B1	B2	D	F	FL	GA	GB	GC	H	H1	H2	I	K	KA	LC	LD	LH	LS	LT	LX	LZ	MM	NA	NN	P	S	WA	WB	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	10.5	26	8	6	41	5	8	28	5	6	4	6.8	25	120	3.2	40	55	M8 x 1.25	24	M20 x 1.5	1/8	80	31	13	20	8	21	149
25	22	19.5	47	17	32	10	13	10.5	26	8	6	45	6	8	33.5	5.5	8	4	6.8	28	120	3.2	40	55	M10 x 1.25	30	M26 x 1.5	1/8	80	31	13	20	8	25	153
32	22	19.5	47	17	32	12	13	10.5	26	8	6	45	6	8	37.5	5.5	10	4	6.8	28	122	3.2	40	55	M10 x 1.25	34.5	M26 x 1.5	1/8	82	31	13	20	8	25	155
40	24	21	54	22	41	14	16	13.5	31	11	6	50	8	10	46.5	7	12	4	7	30	154	3.2	55	75	M14 x 1.5	42.5	M32 x 2	1/4	108	36	16	23	10	27	191

∗ The bracket is shipped together. ∗ Refer to page 703 for female thread dimensions.

Rod Flange (F): 10-11-CM2F, 21-22-CM2F

With rubber bumper

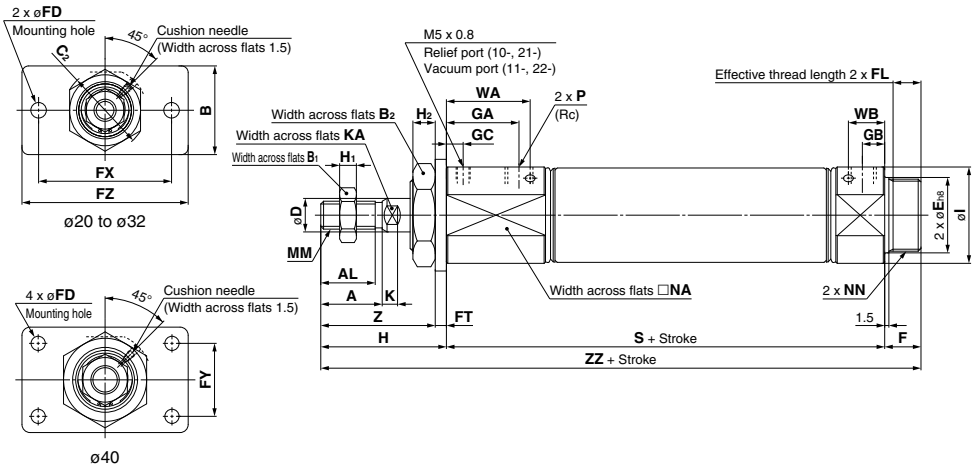


(mm)

Bore size	A	AL	B	B1	B2	C2	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H1	H2	I	K	KA	MM	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	37	116
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	41	120
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	41	122
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	13.5	7	5	66	36	82	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	45	154

∗ The bracket is shipped together. ∗ Refer to page 702 for female thread dimensions.

With air cushion



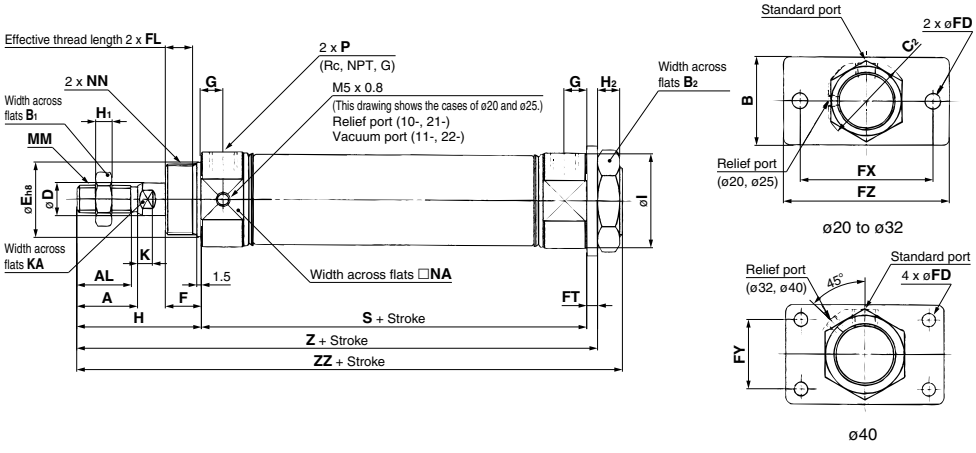
(mm)

Bore size	A	AL	B	B1	B2	C2	D	E	F	FD	FL	FT	FX	FY	FZ	GA	GB	GC	H	H1	H2	I	K	KA	MM	NA	NN	P	S	WA	WB	Z	ZZ
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	10.5	4	60	—	75	26	8	6	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	80	31	13	37	134
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	26	8	6	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	80	31	13	41	138
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	26	8	6	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	82	31	13	41	140
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	13.5	5	66	36	82	31	11	6	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	108	36	16	45	174

∗ The bracket is shipped together. ∗ Refer to page 703 for female thread dimensions.

Head Flange (G): 10-11-CM2G, 21-22-CM2G

With rubber bumper

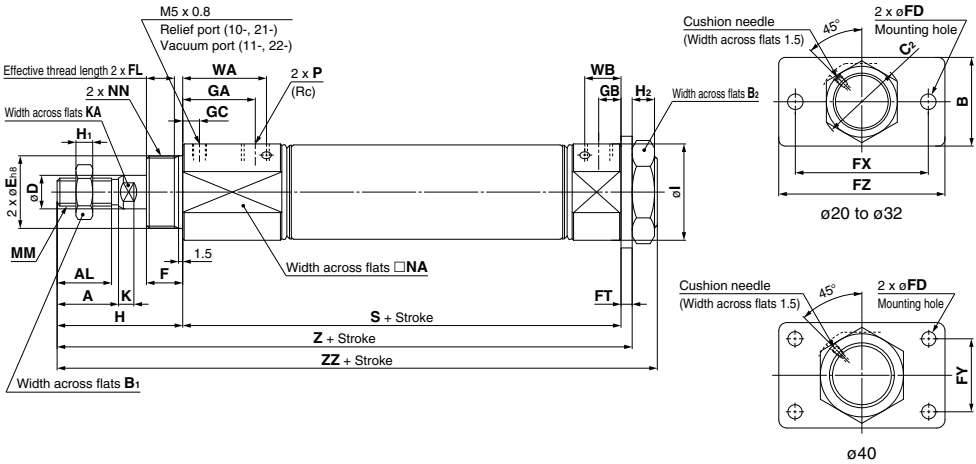


(mm)

Bore size	A	AL	B	B1	B2	C2	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H1	H2	I	K	KA	MM	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	107	116
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	111	120
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	113	122
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	13.5	7	5	66	36	82	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	143	154

∗ The bracket is shipped together. ∗ Refer to page 702 for female thread dimensions.

With air cushion



(mm)

Bore size	A	AL	B	B1	B2	C2	D	E	F	FD	FL	FT	FX	FY	FZ	GA	GB	GC	H	H1	H2	I	K	KA	MM	NA	NN	P	S	WA	WB	Z	ZZ
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	10.5	4	60	—	75	26	8	6	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	80	31	13	125	134
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	26	8	6	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	80	31	13	129	138
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	26	8	6	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	82	31	13	131	140
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	13.5	5	66	36	82	31	11	6	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	108	36	16	163	174

∗ The bracket is shipped together. ∗ Refer to page 703 for female thread dimensions.

⚠ Specific Product Precautions

Be sure to read this before handling.

Handling

⚠Warning

1. Do not rotate the cover.

If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

2. When female rod end is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

3. Do not apply excessive lateral load to the piston rod.

Easy checking method

Minimum operating pressure after the cylinder is mounted to the equipment (MPa) = Minimum operating pressure of cylinder (MPa) + {Load mass (kg) x Friction coefficient of guide/Sectional area of cylinder (mm^2)}

If smooth operation is confirmed within the above value, the load on the cylinder is the resistance of the thrust only and it can be judged as having no lateral load.

⚠Caution

1. Not able to disassemble.

Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.

2. Use caution to the popping of a retaining ring.

When replacing rod seals and removing and mounting a retaining ring, use a proper tool (Retaining ring plier: Tool for installing a type C retaining ring). Even if a proper tool is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier. Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installation.

3. Do not touch the cylinder during operation.

Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.

4. Do not use an air cylinder as an air-hydro cylinder.

If it uses turbine oil in place of fluids for cylinder, it may result in oil leakage.

5. The oil stuck to the cylinder is grease.

6. The base oil of grease may seep out.

The base oil of grease in the cylinder may seep out of the tube, cover, crimped part or rod bushing depending on the operating conditions (ambient temperature 40°C or more, pressurized condition, low frequency operation).

7. When rod end female thread is used, use a thin wrench when tightening the piston rod.

Series 10-/11-/21-/22-CM2W-Z

ø20, ø25, ø32, ø40
Double Rod Cylinder

RoHS

How to Order

Clean series

10	Relief type
11	Vacuum suction type

10 - C D M 2 W L 40 [ ] - 150 F Z - M9BW [ ]

21 - C D M 2 W L 40 [ ] - 150 F Z - M9BW [ ]

Copper, fluorine and silicone-free + Low particle generation

21	Relief type
22	Vacuum suction type

Built-in magnet

Nil	No
D	With auto switch (Built-in magnet)

Mounting

B	Basic
L	Axial foot
F	Flange

Bore size (mm)

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)

Rod end thread

Nil	Male rod end
F	Female rod end

Auto switch

Nil	Without auto switch

* For applicable auto switches, refer to the Applicable Auto Switch.
* The minimum stroke for auto switch mounting, operating range and auto switch mounting brackets/part no. are the same as standard products.

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	n pcs.

Model

	Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Relief type	10-/21-CM2W□20	20	1/8	Non-lube	Double acting, Double rod	25, 50, 75, 100, 125 150, 200, 250, 300	○	○	—
	10-/21-CM2W□25	25							
	10-/21-CM2W□32	32							
	10-/21-CM2W□40	40	1/4						
Vacuum suction type	11-/22-CM2W□20	20	1/8						
	11-/22-CM2W□25	25							
	11-/22-CM2W□32	32							
	11-/22-CM2W□40	40	1/4						

Specifications

Item \ Bore size (mm)	20/25/32/40
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.08 MPa
Ambient and fluid temperature	Without auto switch: –10°C to 70°C With auto switch: –10°C to 60°C (No freezing)
Piston speed	10-/11-: 30 to 400 mm/s, 21-/22-: 50 to 400 mm/s
Stroke length tolerance	$^{+1.4}_{0}$
Mounting	Basic/Axial foot/Flange
Grease	10-/11-: Fluorine grease 21-/22-: Lithium soap based grease
Cleanliness class (ISO class)	10-: Class 4, 21-: Class 5 11-/22-: Class 3

Suction Flow Rate of Vacuum Suction Type (Reference values)

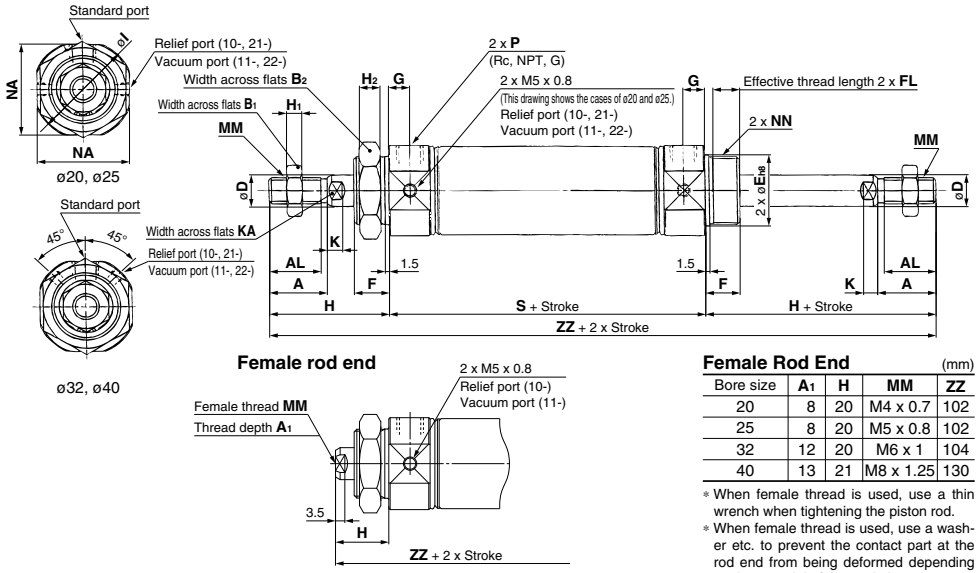
Bore size	Suction flow rate L/min (ANR)
20/25/32/40	2

Auto Switch

Auto switch specifications and the proper mounting positions for stroke end detection are the same as those for double acting, single rod type.

Refer to page 889 for the applicable auto switch list.

Basic (B): 10-11-CM2WB, 21-22-CM2WB



Female rod end

Female Rod End (mm)

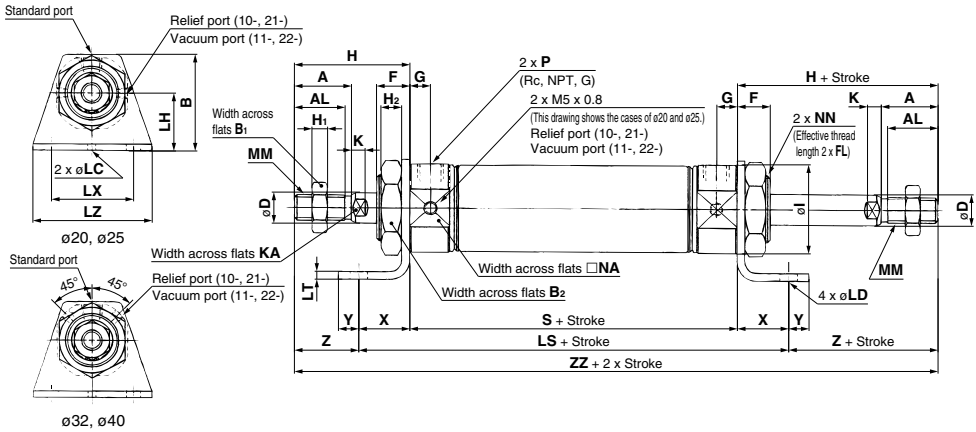
Bore size	A_1	H	MM	ZZ
20	8	20	M4 x 0.7	102
25	8	20	M5 x 0.8	102
32	12	20	M6 x 1	104
40	13	21	M8 x 1.25	130

* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

(mm)

Bore size	A	AL	B_1	B_2	D	E	F	FL	G	H	H_1	H_2	I	K	KA	MM	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	144
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	152
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	154
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	13.5	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	188

Axial Foot (L): 10-11-CM2WL, 21-22-CM2WL

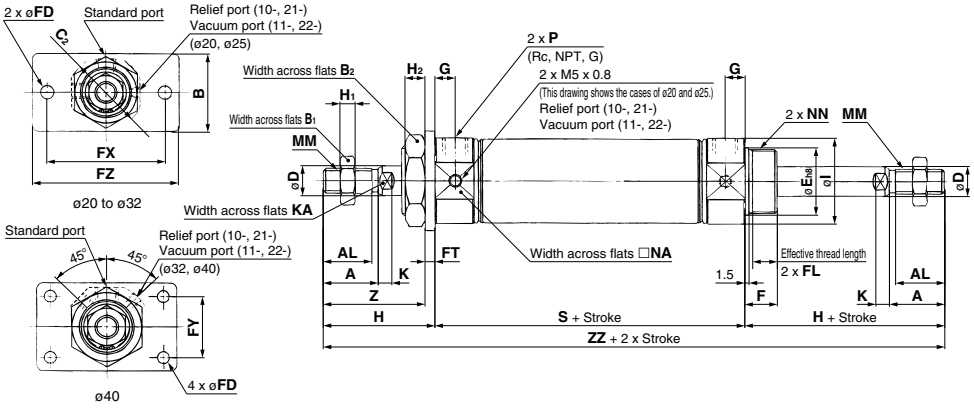


(mm)

Bore size	A	AL	B	B_1	B_2	D	F	FL	G	H	H_1	H_2	I	K	KA	LC	LD	LH	LS	LT	LX	LZ	MM	NA	NN	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	10.5	8	41	5	8	28	5	6	4	6.8	25	102	3.2	40	55	M8 x 1.25	24	M20 x 1.5	1/8	62	20	8	21	144
25	22	19.5	47	17	32	10	13	10.5	8	45	6	8	33.5	5.5	8	4	6.8	28	102	3.2	40	55	M10 x 1.25	30	M26 x 1.5	1/8	62	20	8	25	152
32	22	19.5	47	17	32	12	13	10.5	8	45	6	8	37.5	5.5	10	4	6.8	28	104	3.2	40	55	M10 x 1.25	34.5	M26 x 1.5	1/8	64	20	8	25	154
40	24	21	54	22	41	14	16	13.5	11	50	8	10	46.5	7	12	4	7	30	134	3.2	55	75	M14 x 1.5	42.5	M32 x 2	1/4	88	23	10	27	188

* The bracket is shipped together.
* Refer to the basic type for female thread dimensions.

Flange (F): 10-11-CM2WF, 21-22-CM2WF



(mm)

Bore size	A	AL	B	B_1	B_2	C_2	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H_1	H_2	I	K	KA	MM	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	37	144
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	41	152
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	41	154
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	13.5	7	5	66	36	82	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	45	188

∗ The bracket is shipped together. ∗ Refer to page 710 for female thread dimensions.

⚠ Specific Product Precautions

Be sure to read this before handling.

Handling

⚠Warning

1. Do not rotate the cover.

If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

2. When female rod end is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

3. Do not apply excessive lateral load to the piston rod.

Easy checking method

Minimum operating pressure after the cylinder is mounted to the equipment (MPa) = Minimum operating pressure of cylinder (MPa) + {Load mass (kg) x Friction coefficient of guide/Sectional area of cylinder (mm^2)}

If smooth operation is confirmed within the above value, the load on the cylinder is the resistance of the thrust only and it can be judged as having no lateral load.

⚠Caution

1. Not able to disassemble.

Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.

2. Use caution to the popping of a retaining ring.

When replacing rod seals and removing and mounting a retaining ring, use a proper tool (Retaining ring plier: Tool for installing a type C retaining ring). Even if a proper tool is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier. Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installation.

3. Do not touch the cylinder during operation.

Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.

4. Do not use an air cylinder as an air-hydro cylinder.

If it uses turbine oil in place of fluids for cylinder, it may result in oil leakage.

5. The oil stuck to the cylinder is grease.

6. The base oil of grease may seep out.

The base oil of grease in the cylinder may seep out of the tube, cover, crimped part or rod bushing depending on the operating conditions (ambient temperature 40°C or more, pressurized condition, low frequency operation).

7. When rod end female thread is used, use a thin wrench when tightening the piston rod.

Series 10-/11-/21-/22-CM2R-Z

ø20, ø25, ø32, ø40
Direct Mount Cylinder

RoHS

How to Order

Clean series

10	Relief type
11	Vacuum suction type

10-CDM2RA40□-150FZ-M9BW□

21-CDM2RA40□-150FZ-M9BW□

Copper, fluorine and silicone-free + Low particle generation

21	Relief type
22	Vacuum suction type

Built-in magnet

Nil	No
D	With auto switch (Built-in magnet)

Mounting

A	Bottom
B	Front

Bore size (mm)

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)

Rod end thread

Nil	Male rod end
F	Female rod end

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	n pcs.

Auto switch

Nil	Without auto switch

* For applicable auto switches, refer to the Applicable Auto Switch.
* The minimum stroke for auto switch mounting, operating range and auto switch mounting brackets/part no. are the same as standard products.

Model

	Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Relief type	10-/21-CM2R□20	20	1/8	Non-lube	Double acting, Single rod	25, 50, 75, 100, 125, 150	○	○	—
	10-/21-CM2R□25	25				25, 50, 75,100, 125, 150, 200			
	10-/21-CM2R□32	32							
	10-/21-CM2R□40	40	1/4			25, 50, 75, 100, 125, 150, 200, 250, 300			
Vacuum suction type	11-/22-CM2R□20	20	1/8			25, 50, 75, 100, 125, 150			
	11-/22-CM2R□25	25				25, 50, 75, 100, 125, 150, 200			
	11-/22-CM2R□32	32							
	11-/22-CM2R□40	40	1/4			25, 50, 75, 100, 125, 150, 200, 250, 300			

Specifications

Item \ Bore size (mm)	20/25/32/40
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.05 MPa
Ambient and fluid temperature	Without auto switch: –10°C to 70°C With auto switch: –10°C to 60°C (No freezing)
Piston speed	10-/11-: 30 to 400 mm/s, 21-/22-: 50 to 400 mm/s
Stroke length tolerance	$^{+1.4}_{0}$
Mounting	Bottom/Front
Grease	10-/11-: Fluorine grease 21-/22-: Lithium soap based grease
Cleanliness class (ISO class)	10-: Class 4, 21-: Class 5
	11-/22-: Class 3

Suction Flow Rate of Vacuum Suction Type (Reference values)

Bore size	Suction flow rate L/min (ANR)
20/25/32/40	2

Auto Switch

Auto switch specifications and the proper mounting positions for stroke end detection are the same as those for double acting, single rod type.

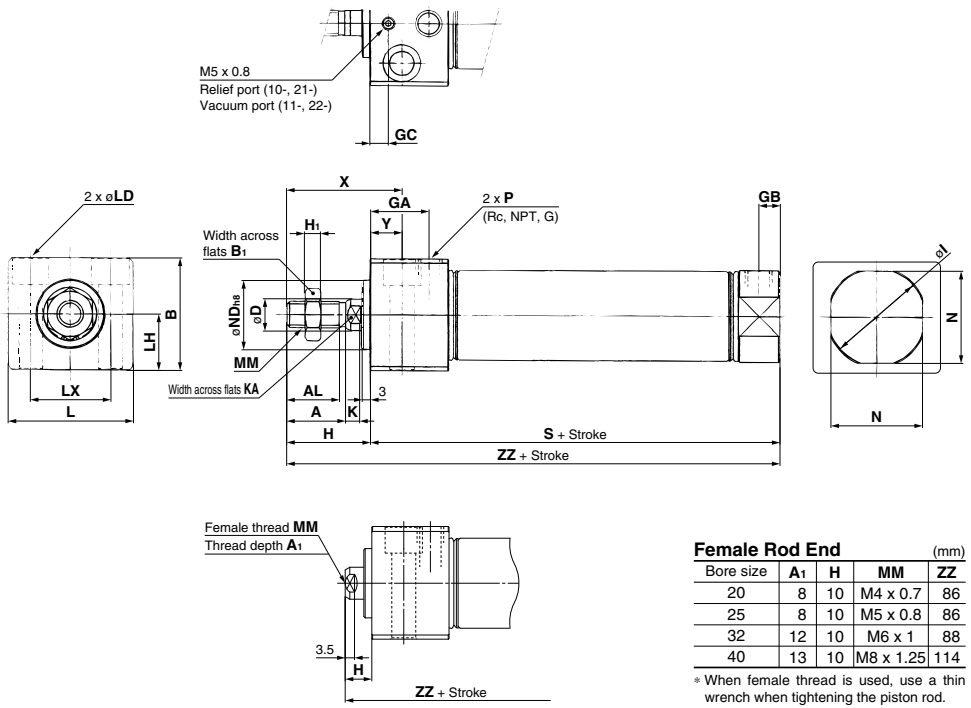
Refer to page 889 for the applicable auto switch list.

⚠Specific Product Precautions

Refer to page 708.

SMC

Bottom Mounting: 10-11-CM2RA, 21-22-CM2RA



Female Rod End (mm)

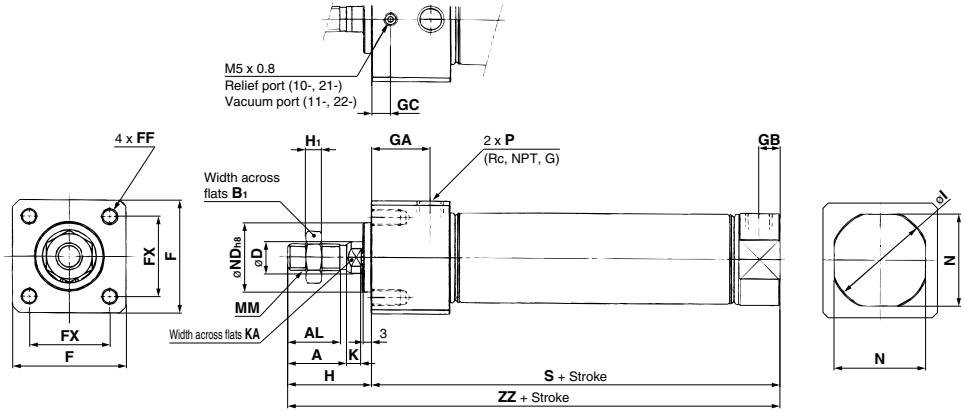
Bore size	A_1	H	MM	ZZ
20	8	10	M4 x 0.7	86
25	8	10	M5 x 0.8	86
32	12	10	M6 x 1	88
40	13	10	M8 x 1.25	114

* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

(mm)

Bore size	A	AL	B	B_1	D	GA	GB	GC	H	H_1	I	K	KA	L	LD	LH	LX	MM	N	ND	P	S	X	Y	ZZ
20	18	15.5	30.3	13	8	22	8	6	27	5	28	5	6	33.5	ø5.5, ø9.5 counterbore depth 6.5	15	21	M8 x 1.25	24	$20^{0}_{-0.033}$	1/8	76	39	12	103
25	22	19.5	36.3	17	10	22	8	6	31	6	33.5	5.5	8	39	ø6.6, ø11 counterbore depth 7.5	18	25	M10 x 1.25	30	$26^{0}_{-0.033}$	1/8	76	43	12	107
32	22	19.5	42.3	17	12	22	8	7	31	6	37.5	5.5	10	47	ø9, ø14 counterbore depth 10	21	30	M10 x 1.25	34.5	$26^{0}_{-0.033}$	1/8	78	43	12	109
40	24	21	52.3	22	14	27	11	9	34	8	46.5	7	12	58.5	ø11, ø17.5 counterbore depth 12.5	26	38	M14 x 1.5	42.5	$32^{0}_{-0.039}$	1/4	104	49	15	138

Front Mounting: 10-11-CM2RB, 21-22-CM2RB



(mm)

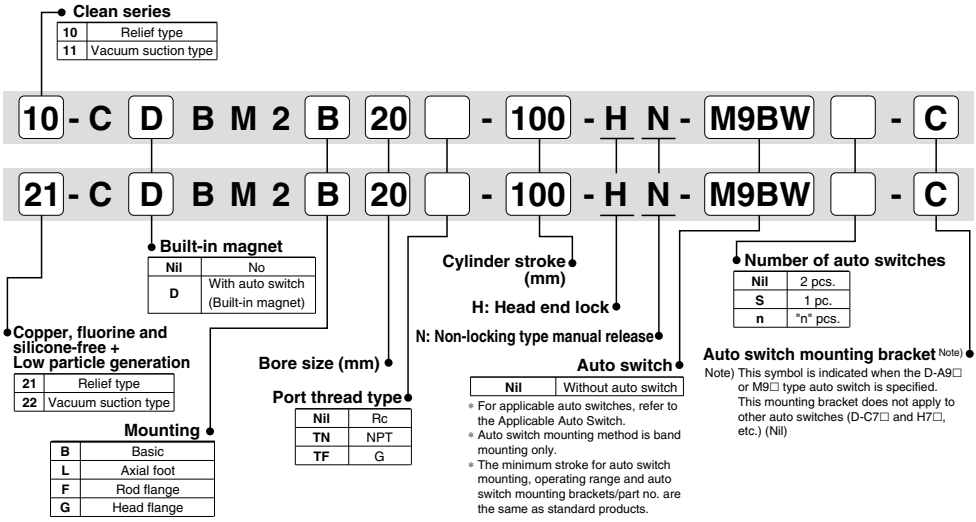
Bore size	A	AL	B_1	D	F	FF	FX	GA	GB	GC	H	H_1	I	K	KA	MM	N	ND	P	S	ZZ
20	18	15.5	13	8	30.4	M5 x 0.8 thread depth 9	22	22	8	6	27	5	28	5	6	M8 x 1.25	24	$20^{0}_{-0.033}$	1/8	76	103
25	22	19.5	17	10	36.4	M6 x 1 thread depth 11	26	22	8	6	31	6	33.5	5.5	8	M10 x 1.25	30	$26^{0}_{-0.033}$	1/8	76	107
32	22	19.5	17	12	42.4	M6 x 1 thread depth 11	30	22	8	7	31	6	37.5	5.5	10	M10 x 1.25	34.5	$26^{0}_{-0.033}$	1/8	78	109
40	24	21	22	14	52.4	M8 x 1.25 thread depth 14	36	27	11	9	34	8	46.5	7	12	M14 x 1.5	42.5	$32^{0}_{-0.039}$	1/4	104	138

∗ Refer to page 714 for female thread dimensions.

Series 10-/11-/21-/22-CBM2

ø20, ø25, ø32, ø40
Cylinder with End Lock (Head End Lock)

How to Order



Model

Model		Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Relief type	10-/21-CBM2□20	20	1/8	Non-lube	Double acting, single rod	25, 50, 75, 100, 125, 150, 200, 250, 300	Available	Available	Not available
	10-/21-CBM2□25	25							
	10-/21-CBM2□32	32							
	10-/21-CBM2□40	40	1/4						
Vacuum suction type	11-/22-CBM2□20	20	1/8						
	11-/22-CBM2□25	25							
	11-/22-CBM2□32	32							
	11-/22-CBM2□40	40	1/4						

Specifications

Item \ Bore size (mm)	20/25/32/40
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.15 MPa *
Ambient and fluid temperature	Without auto switch: –10°C to 70°C, With auto switch: –10°C to 60°C (No freezing)
Piston speed	10-/11-: 30 to 400 mm/s, 21-/22-: 50 to 400 mm/s
Stroke length tolerance	$^{+1.4}_{0}$
Mounting	Basic/Axial foot/Rod flange/Head flange
Grease	10-/11-: Fluorine grease 21-/22-: Lithium soap based grease
Cleanliness class (ISO class)	10-: Class 4, 21-: Class 5 11-/22-: Class 3

* 0.05 MPa for parts other than the lock unit

Lock Specifications

Lock position	Head end			
Holding force (Max.) N	ø20	ø25	ø32	ø40
	215	330	550	860
Backlash	1 mm or less			
Manual release	Non-locking type			

Suction Flow Rate of Vacuum Suction Type (Reference values)

Bore size	Suction flow rate L/min (ANR)
20/25/32/40	2

Auto Switch Specifications (Refer to the WEB catalog for detailed specifications and auto switches not in the following table.)

Type	Electrical entry	Indicator light	Wiring (Output)	Load voltage			Auto switch model	Lead wire length (m)				Applicable load	
				DC		AC	Band mounting	0.5 (Nil)	1 (M)	3 (L)	5 (Z)		
Solid state auto switch	Grommet	Yes	2-wire	24 V	5 V, 12 V	—	**M9B**	●	●	●	○	—	Relay, PLC
							M9BW	●	●	●	○		
Reed auto switch	Grommet	Yes	2-wire	24 V	12 V	100 V	**A93**	●	—	●	●		

Note 1) Lead wire length symbols: 0.5 m.....Nil M9BW
1 m..... M M9BWM
3 m..... L M9BWL
5 m..... Z M9BWZ

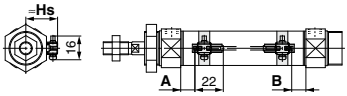
Note 2) Auto switches marked with "○" are produced upon receipt of order.
Note 3) PLC: Programmable Logic Controller

Refer to page 889 for the applicable auto switch list.

Auto Switch Proper Mounting Position (Detection at Stroke End)

Solid state auto switch

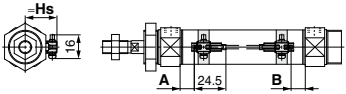
D-M9□
D-M9□W



A and B are the dimensions from the end of the head cover/ rod cover to the end of the auto switch.

Reed auto switch

D-A9□



A and B are the dimensions from the end of the head cover/ rod cover to the end of the auto switch.

Auto Switch Proper Mounting Position (mm)

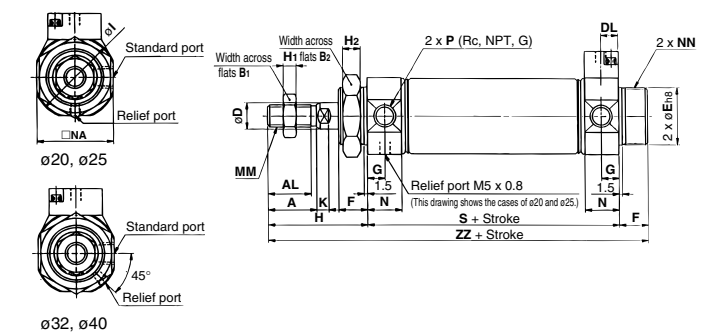
Auto switch model / Bore size	D-M9□ D-M9□W		D-A9□	
	A	B	A	B
20	10.5	9.5	6.5	5.5
25	10.5	9.5	6.5	5.5
32	11.5	10.5	7.5	6.5
40	17.5	15.5	13.5	11.5

Note) The above-mentioned value is a guide for auto switch mounting positions for stroke end detection. When actually mounting the auto switch, adjust the position after confirming the operating state of the auto switch.

Auto Switch Mounting Height (mm)

Auto switch model / Bore size	D-M9□ D-M9□W D-A9□
	Hs
20	22.5
25	25
32	28.5
40	32.5

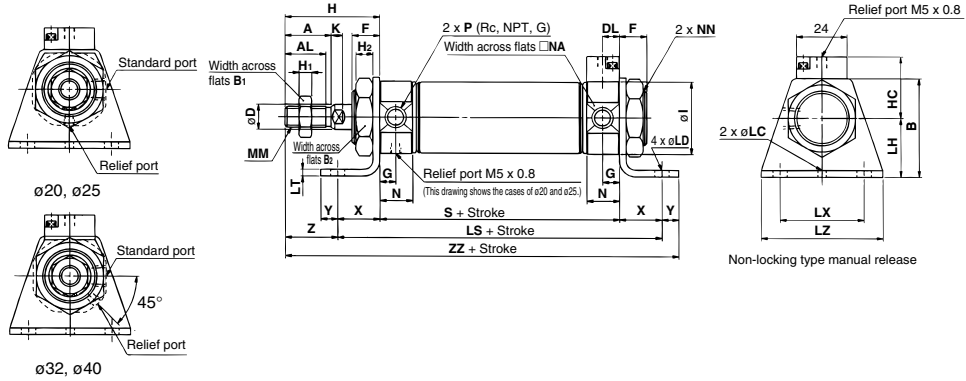
Basic (B): 10-11-CBM2B, 21-22-CBM2B



(mm)

Bore size	A	AL	B1	B2	D	DL	E	F	G	H	H1	H2	HC	I	K	MM	N	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	7.5	20 0 -0.033	13	8	41	5	8	24	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8	62	116
25	22	19.5	17	32	10	7.5	26 0 -0.033	13	8	45	6	8	27	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8	62	120
32	22	19.5	17	32	12	7.5	26 0 -0.033	13	8	45	6	8	29.3	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	122
40	24	21	22	41	14	10.7	32 0 -0.039	16	11	50	8	10	33.3	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	154

Axial Foot (L): 10-11-CBM2L, 21-22-CBM2L



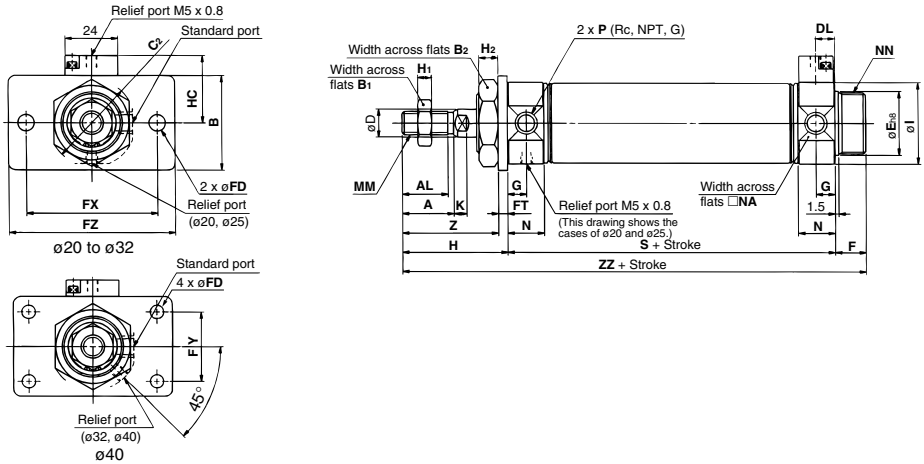
(mm)

Bore size	A	AL	B	B1	B2	D	DL	F	G	H	H1	H2	HC	I	K	LC	LD	LH	LS	LT	LX	LZ	MM
20	18	15.5	40	13	26	8	7.5	13	8	41	5	8	24	28	5	4	6.8	25	102	3.2	40	55	M8 x 1.25
25	22	19.5	47	17	32	10	7.5	13	8	45	6	8	27	33.5	5.5	4	6.8	28	102	3.2	40	55	M10 x 1.25
32	22	19.5	47	17	32	12	7.5	13	8	45	6	8	29.3	37.5	5.5	4	6.8	28	104	3.2	40	55	M10 x 1.25
40	24	21	54	22	41	14	10.5	16	11	50	8	10	33.3	46.5	7	4	7	30	134	3.2	55	75	M14 x 1.5

(mm)

Bore size	N	NA	NN	P	S	X	Y	Z	ZZ
20	15	24	M20 x 1.5	1/8	62	20	8	21	131
25	15	30	M26 x 1.5	1/8	62	20	8	25	135
32	15	34.5	M26 x 1.5	1/8	64	20	8	25	137
40	21.5	42.5	M32 x 2	1/4	88	23	10	27	171

Rod Flange (F): 10-/11-CBM2F, 21-/22-CBM2F



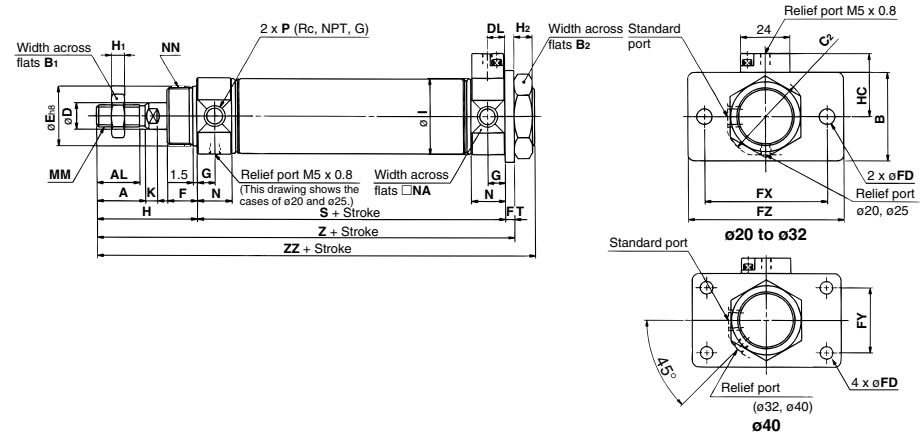
(mm)

Bore size	A	AL	B	B1	B2	C2	D	DL	E	F	FD	FT	FX	FY	FZ	G	H	H1	H2	HC	I	K	MM
20	18	15.5	34	13	26	30	8	7.5	$20^{0}_{-0.033}$	13	7	4	60	—	75	8	41	5	8	24	28	5	M8 x 1.25
25	22	19.5	40	17	32	37	10	7.5	$26^{0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	27	33.5	5.5	M10 x 1.25
32	22	19.5	40	17	32	37	12	7.5	$26^{0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	29.3	37.5	5.5	M10 x 1.25
40	24	21	52	22	41	47.3	14	10.5	$32^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	33.3	46.5	7	M14 x 1.5

(mm)

Bore size	N	NA	NN	P	S	Z	ZZ
20	15	24	M20 x 1.5	1/8	62	37	116
25	15	30	M26 x 1.5	1/8	62	41	120
32	15	34.5	M26 x 1.5	1/8	64	41	122
40	21.5	42.5	M32 x 2	1/4	88	45	154

Head Flange (G): 10-11-CBM2G, 21-22-CBM2G



(mm)

Bore size	A	AL	B	B1	B2	C2	D	DL	E	F	FD	FT	FX	FY	FZ	G	H	H1	H2	HC	I	K	MM
20	18	15.5	34	13	26	30	8	7.5	$20^{0}_{-0.033}$	13	7	4	60	—	75	8	41	5	8	24	28	5	M8 x 1.25
25	22	19.5	40	17	32	37	10	7.5	$26^{0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	27	33.5	5.5	M10 x 1.25
32	22	19.5	40	17	32	37	12	7.5	$26^{0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	29.3	37.5	5.5	M10 x 1.25
40	24	21	52	22	41	47.3	14	10.7	$32^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	33.3	46.5	7	M14 x 1.5

(mm)

Bore size	N	NA	NN	P	S	Z	ZZ
20	15	24	M20 x 1.5	1/8	62	107	116
25	15	30	M26 x 1.5	1/8	62	111	120
32	15	34.5	M26 x 1.5	1/8	64	113	122
40	21.5	42.5	M32 x 2	1/4	88	143	154

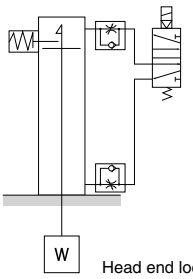
⚠ Specific Product Precautions

Be sure to read this before handling.

Use the recommended pneumatic circuit.

⚠ Caution

1. This is necessary for proper operation and release of the lock.



Head end lock

Handling

⚠ Caution

1. Do not use 3 position solenoid valves.
Avoid use in combination with 3 position solenoid valves (especially closed center metal seal types). If pressure is trapped in the port on the lock mechanism side, the cylinder cannot be locked.
Furthermore, even after being locked, the lock may be released after some time, due to air leaking from the solenoid valve and entering the cylinder.

2. Back pressure is required to release end lock.
Be sure air is supplied to the side of the cylinder without a lock mechanism, before starting up, as in the above figures. Otherwise, the lock may not be released. (Refer to "Releasing the Lock".)

3. Release the lock when mounting or adjusting the cylinder.
If mounting or other work is performed when the cylinder is locked, the lock unit may be damaged.

4. Operate with a load ratio of 50% or less.
If the load ratio exceeds 50%, this may cause problems such as failure of the lock to release, or damage to the lock unit.

5. Do not operate multiple cylinders in synchronization.
Avoid applications in which two or more end lock cylinders are synchronized to move one workpiece, as one of the cylinder locks may not be able to release when required.

6. Use a speed controller with meter-out control.
Lock cannot be released occasionally by meter-in control.

7. Be sure to operate completely to the cylinder stroke end on the side with the lock.
If the cylinder piston does not reach the end of the stroke, locking might not work or locking might not be released.

Operating Pressure

⚠ Caution

1. Supply air pressure of 0.15 MPa or higher to the port on the lock mechanism side, as it is necessary for releasing the lock.

Exhaust Speed

⚠ Caution

1. Locking will occur automatically if the pressure applied to the port on the lock mechanism side falls to 0.05 MPa or less. In cases where the piping on the lock mechanism side is long and thin, or the speed controller is separated at some distance from the cylinder port, the exhaust speed will be reduced. Take note that some time may be required for the lock to engage. In addition, clogging of a silencer mounted on the solenoid valve exhaust port can produce the same effect.

Releasing the Lock

⚠ Warning

1. Before releasing the lock, be sure to supply air to the side without the lock mechanism, so that there is no load applied to the lock mechanism when it is released. (Refer to the recommended pneumatic circuits.) If the lock is released when the port on the other side is in an exhaust state, and with a load applied to the lock unit, the lock unit may be subjected to an excessive force and be damaged. Furthermore, sudden movement of the piston rod is very dangerous.

Manual Release

⚠ Caution

1. Insert the accessory bolt from the top of the rubber cap, and after screwing it into the lock piston, pull it to release the lock. If you stop pulling the bolt, the lock will return to an operating state. Bolt sizes, pulling forces and strokes are as shown below.

Bore size (mm)	Bolt size	Pulling force	Stroke (mm)
ø20, ø25, ø32	M2.5 x 0.45 x 25 L or more	4.9 N	2
ø40	M3 x 0.5 x 30 L or more	10 N	3

Remove the bolt for normal operation.
It can cause lock malfunction or faulty release.